periodicals especially devoted to the particular subjects, or in publications which have wide circulation and are well known to habitually publish such papers. If all publishers and naturalists would take the same position it would surely greatly simplify the work of the future systematist. Junius Henderson

THE EFFECT OF CYANIDE ON THE LOCUST-BORER AND THE LOCUST-TREE

During the past five years a number of experiments have been made from the office of the Illinois state entomologist with methods for destroying the black locust-borer (*Cyllene robiniæ*). From articles appearing in Science during the last few months, especially those by Professor Fernando Sanford in the issue of October 9, 1914, and by Professor C. H. Shattuck in the issue of February 26, 1915, it seemed probable that at least a part of the borers in infested locust-trees might be killed by introducing small amounts of potassium cyanide into the trunk and bark.

Early in the spring of 1915, fifty black locust-trees, fourteen in a small grove at Athens, in central Illinois, and thirty-six in a large plantation at Union Grove, in northwestern Illinois, were treated with potassium cyanide and sodium cyanide in the following manner:

The trees selected were from one to seven inches in diameter and were nearly all badly infested with the larvæ of the locust-borer. The borers were still in their overwintering cells in the bark, but were just becoming active at the time. The cyanide was placed in the trees in auger-holes of one fourth, one half, three fourths, and one inch diameter, bored at different heights from the ground and different depths into the trunk. The amounts of cyanide used in single trees varied from one twentieth to one half an ounce. The chemicals used were potassium cyanide, 98 per cent. pure, in small lumps, and cyanide-chloride carbonate mixture in granular form, guaranteed to contain 35–38 per cent. sodium cyanide. After the cyanide had been placed in the trees, the auger-holes were tightly plugged with corks driven in with a hammer.

The fourteen trees at Athens were treated March 12, and the thirty-six trees at Union Grove, April 1, 1915. The results of the treatments were taken at Union Grove July 13 and at Athens July 15, 1915.

The results of this experiment showed no benefit by the treatment. Of the fifty trees treated, eight could not be located in the summer, owing to the dense growth of weeds and sprouts. The treatment of these eight trees did not differ materially from that given the forty-two examined, and could not have made any marked difference in the results. Of the forty-two trees examined in July, twenty-three were dead and nineteen alive. Of the nineteen living trees, all but three contained living larvæ of *Cyllene robiniæ*. In several cases living borers were found directly above and within six inches of the auger-holes, and in three cases the borers were within one inch of the auger-holes. Not only were the borers alive in the living trees, but in all cases where the trees had put forth leaves in the spring of 1915, living borers were present in numbers in the trunks, and could be found around the bases of the trunks of many of the trees that had not shown foliage the past spring. Not a single dead borer was found near the points where the cyanide had been placed.

While over half of the trees treated were dead, this was not entirely due to the effects of the cyanide, as at least twenty-five per cent. of the untreated trees in both groves had died from the effects of borer injuries. There can be no doubt, however, that the cyanide had a very injurious effect on the trees, as in all the living trees the bark was dead and the wood discolored for a greater or less distance around the holes where the cyanide had been placed.

It was an interesting fact, which has, however, no bearing on the effect of the cyanide on the trees, that some rodents, probably rabbits, had gnawed many of the trees around the auger-holes, deeply scoring the wood. There was no residue from the cyanide in any of the auger-holes when examined in July, whether the corks had been removed or not, and no odor of the cyanide could be detected in the wood.

No chemical tests were made for the presence of cyanide.

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August 6, 1915

A NEW MITOTIC STRUCTURE

IN the *Journal of the Royal Microscopical Society,* April, 1915, Mr. E. Sheppard, F.R.M.S., published a paper entitled "A New Mitotic Structure Disclosed as the Result of New Technique." He describes at the ends of the dividing chromosomes "bead-like chromatin extensions" where the spindle fibers are attached. I want to draw his attention to the fact that these structures are well known to cytologists and that there is no special technique needed for their disclosure. My own experience is that they are most extremely developed in the maturation divisions of Trematodes. I have figured them in my paper "Die Chromatinreifung der Geschlechtszellen des Zoogonus mirus, etc.," *Arch. Zellforschg.,* Vol. 2, 1908. Better figures are found in Grégoire's publication, based on the same slides "La réduction dans le Zoogonus mirus, etc.," *La Cellule,* 25, 1909. He calls these structures "renflement d'insertion." For *Fasciola hepatica* they are described by A. Schellenberg, "Ovogenese, Eireifung und Befruchtung von *Fasciola hepatica* Arch. Zellforschg.," Vol. 6, 1910, and I know their presence in some other trematodes.

R. GOLDSCHMIDT

A METHOD OF MAINTAINING A SUPPLY OF PROTOZOA FOR LABORATORY USE

ONE of the difficulties that confront the teacher of elementary biology, especially in those institutions where a large number of students must be provided for, is that of obtaining a satisfactory supply of protozoa, especially of such forms as *Ameba, Euglena* and *Paramecium.* I have overcome this difficulty in such a simple manner that it may be worth while to state briefly how I keep a supply of these forms on hand. Four years ago I obtained from a pond some water and rubbish in which were present a few individuals of *Ameba, Euglena* and *Paramecium.* I prepared a culture made by boiling a handful of hay in about a half-gallon of water until the liquid assumed a dark brown color. This with a part of the hay was placed in a two-quart, cylindrical battery jar and permitted to stand open in the laboratory for twenty-four hours. The jar was then covered loosely with a pane of glass and set aside till bacteria had formed a scum over the surface of the liquid. The pond water and rubbish were then added and the jar still covered was set in a north window of the laboratory.

In a short time an abundance of *Paramecia* was present in the culture. The *Euglenæ* and *Amebæ* multiplied more slowly, but at the end of six months the jar was swarming with these two forms, while the *Paramecia* had decreased in number and were to be found chiefly at the bottom of the jar. Such a culture will usually afford a good supply for a year but I prepare a new culture every six months and stock it from the old one. By this method I have for the past four years kept on hand an abundant supply of these protozoa without going outside of my laboratory. At the opening of college I have on hand a culture newly prepared, in order to have an abundance of *Paramecia,* a second culture six months old and a third one year old. The hay infusion and the decomposing vegetable matter in the jar seem to furnish suitable food for the bacteria and *Euglena; Paramecium* feeds on the bacteria and *Ameba* on the encysted *Euglena.* Rotifers and a host of other protozoan forms abound in the cultures but the three forms most used in laboratory exercises are always present in abundance. In my laboratory I find it necessary to keep the culture in a north window; direct sunlight is not only not necessary but decidedly harmful, due probably to the heat rather than the light.

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QUOTATIONS

SCIENCE IN NATIONAL AFFAIRS

WE printed last week a valuable address by Professor J. A. Fleming on "Science in the